Technical Notes - 3
Pathology

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Division of Forest Pathology, B. P. I.
in cooperation with

APPALACHIAN FOREST EXPERIMENT STATION

Relation Between Height of Decay and Tree Age in Certain Eastern Oaks

The Accompanying graphs show part of the results of an extensive study of decay in eastern hardwoods. The data were taken on logging operations in several eastern states from 1924 to 1927. Data on cull trees that were not cut are not included. Data were taken on all trees cut on the plots taken within the logging units. As the cull trees were mainly trees badly top-rotted, stagheaded, or dead, leaving them out does not materially affect the study of butt rot.

Height of decay was measured at the ends of logs and on jump butts. Where the work was done on cross tie or pole operations or operations for getting out wood for special purposes, the figures on height of decay are accurate. On lumber operations, where the butt logs could not be split unless they were jump butts, the figures on height of decay are approximate. Height of butt rot is measured from the ground line.

Most of the trees included in the study were of seedling or seedling-sprout origin. Stands arising from stump sprouts might show higher decay in the young age classes. Roughly 90% of the decay encountered was the result of fire scarring.

The following table shows the states in which the plots from which the trees in this study were taken were located. It also shows the number of trees upon which the accompanying graphs are based.

	White oak	Chestnut oak	N.Red Oak	Black oak	Scarl.oak
New Jersey	X	X	0	X	X
Pennsylvania	X	X	X	0	X
Ohio	X	X	X	X	X
Maryland	X	0	X	0	0
Dist. of Columbia	X	0	0	X	0
Virginia (west)	X	0	X	0	0
North Carolina (west)	X	X	X	0	X
North Carolina (cent.)	X	0	0	X	X
Tennessee	0	0	0	X	X
Total trees (basis for Fig.1)	2014	654	653	866	1196
Butt-rot trees(" " Fig.2)	560	206	211	225	398

Figure 1 shows average height of decay on tree age for all trees examined, and Figure 2 shows average height of decay on tree age for the trees showing butt rot.

The chart based on butt-rotted trees (Fig.2) might be used in applying a height-of-decay factor for oaks showing evidence of butt-rot, provided the ages of the trees are known. Such figures would be conservative for a given stand because in many cases butt-rotted trees will show no evidence of butt rot on the outside. These curves should be applicable for oak stands not made up mostly of stump sprouts, within the states in which the study was made. Within any given locality the height of decay may vary somewhat from that given in Figures 1 and 2. Over large areas, however, these graphs should give a fairly accurate measure of the height of decay to be expected in the species included.

The somewhat peculiar curvature of the chestnut oak curve in Figure 2 is probably due to local variation in decay height, as different parts of the curves are mainly based on trees from different localities. These graphs simply show the average height of decay for a given tree age and give no indication of the scatter of the individual cases about these averages.

In Figure 1 the flattening out and subsequent falling off of some of the curves at the high age classes is probably due to the dropping out of the more badly decayed trees. This partial decimation results in the best trees comprising the remaining stand. It is therefore possible that the average height of decay per tree in a stand 350 years old would be less than in the same stand when 250 years old.

Graphs showing the relation between diameter breast high and tree age will probably be made available in the near future.

By George G. Hedgcock, Senior Pathologist
and George H. Hepting, Field Assistant,
Division of Forest Pathology,
Bureau of Plant Industry,
United States Department of Agriculture.

FIGURE I
RELATION BETWEEN HEIGHT OF BUTT ROT AND TREE AGE

(for all trees on plots - sound + decayed)

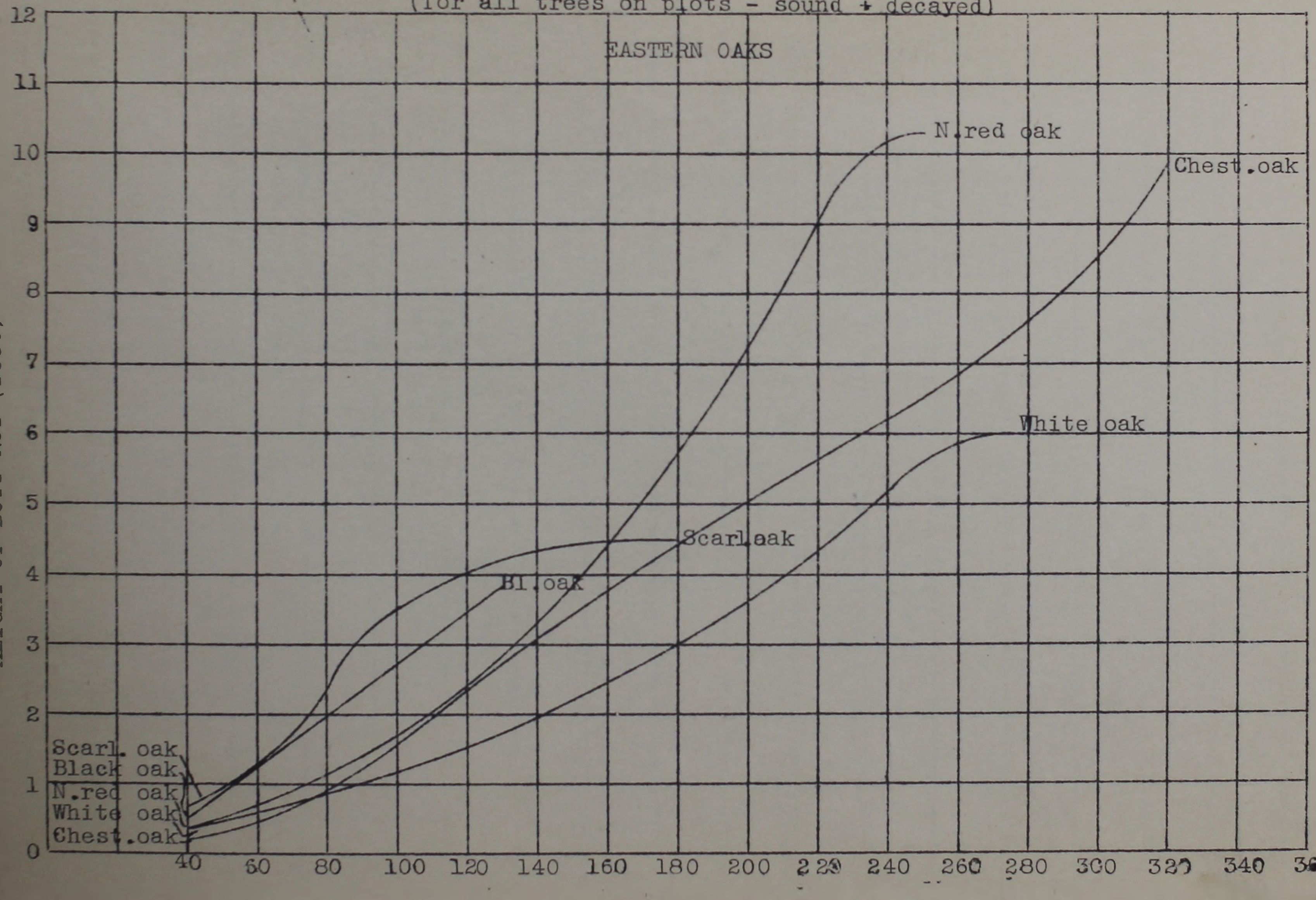

FIGURE 2

RELATION BETWEEN HEIGHT OF BUTT ROT AND TREE AGE

(for trees with butt rot)

EASTERN OAKS